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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/747,619	12/30/2003	Jin Hyo Jung	040008-0307458	4031
909	7590	03/07/2005		EXAMINER
PILLSBURY WINTHROP, LLP				NHU, DAVID
P.O. BOX 10500			ART UNIT	PAPER NUMBER
MCLEAN, VA 22102			2818	

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

CT

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/747,619	JUNG, JIN HYO
	Examiner David Nhu	Art Unit 2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 30 December 2003.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-6 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-6 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTIONS

### *Drawings*

1. *Figures 1a, 1b should be designated by a legend such as—Prior Art—because only that which is old is illustrated. See MPEP & 608.02(g).*

### **Claims Objection**

2. Claim 1, "the material of the tunnel oxide layer" lacks a clear antecedent basis.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hong (5,969,384).

Regarding claim 1, Hong, (see figures 2F-2H, col. 2, lines 21-67, col. 3, lines 1-67, col. 4, lines 1-44), teaches a method of fabricating a flash memory device comprising the steps of: forming a tunnel oxide layer 42a, 42b on a semiconductor substrate 30, the tunnel oxide material layer having a conduction band energy level lower than that of SiO<sub>2</sub> (see figure 2F, col. 2, lines 57-60); forming a floating gate 44 on the tunnel oxide layer; forming an integrate dielectric layer 46 on the floating gate; forming a control gate 48 on the integrate dielectric layer; forming a gate electrode by patterning the tunnel oxide layer, the floating gate, the control gate, and the integrate dielectric layer; and forming a source/drain region 36, 38 by performing a ion implantation into the substrate using the gate electrode as a mask (see figures 2A-2C).

Regarding claims 2-6, Hong, (see figures 1-2, col. 1-6), also teaches the tunnel oxide layer is made of one selected from the group of material with a conduction band energy level lower than that of SiO<sub>2</sub>; forming a first tunnel oxide layer 42a on the semiconductor substrate 30; forming a second tunnel oxide layer 42b on the first tunnel oxide layer 42a; wherein the first and second tunnel oxide layer are made of one selected from the group of material (SiO<sub>2</sub>) with a conduction band energy level equal or similar to that of SiO<sub>2</sub>; wherein the first tunnel oxide layer 42a is deposited more thickly than the second tunnel oxide layer 42b (see figure 2H).

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 1 are rejected under 35 U.S.C. 102(e) as being anticipated by Forbes et al (6,781,876 B2).

**Regarding claim 1,** Forbes, (see figures 2, 3, col. 6, lines 9-67, col. 7, lines 1-30), teaches a method of fabricating a flash memory device comprising the steps of: forming a tunnel oxide layer 225 on a semiconductor substrate 230, the tunnel oxide material layer having a conduction band energy level lower than that of SiO<sub>2</sub> (figure 3, col. 6, lines 37-67 ); forming a floating gate 215 on the tunnel oxide layer; forming an integrate dielectric layer 235 on the floating gate; forming a control gate 220 on the integrate dielectric layer; forming a gate

Art Unit: 2818

electrode by patterning the tunnel oxide layer, the floating gate, the control gate, and the integrate dielectric layer; and forming a source/drain region 205, 210 by performing a ion implantation into the substrate using the gate electrode as a mask (see figures 2-3).

### **Conclusion**

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Da'245, Forbes'448, Forbes'535, Nagamine'988 are cited as of interest.
8. A shortened statutory period for response to this action is set to expired 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned(see 710.02 (b)).
9. Any inquiry concerning this communication on earlier communications from the examiner should be directed to David Nhu (571)272-1792. The examiner can normally be reached on Monday-Friday from 7:30 AM to 5:00 PM. The examiner's supervisor, David Nelms can be reached on (571)272-1787.

*The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.*

*Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.*

*Information regarding the status of an application may be obtained from the patent application information retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR*

Application/Control Number: 10/747,619  
Art Unit: 2818

Page 5

*system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).*

David Nhu 



March 4, 2005